United States
Environmental Protection
Agency

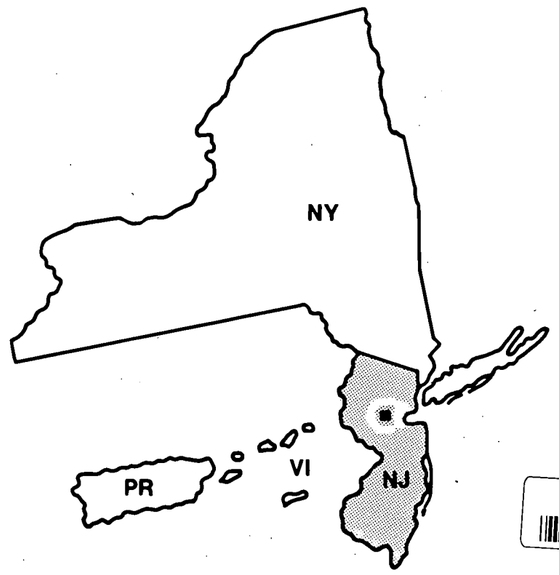
Environmental Monitoring
Systems Laboratory
P.O. Box 93478
Las Vegas NV 89193-3478

TS-PIC-90900
February 1991

Research and Development

EPA Site Analysis Chemsol Site Piscataway, New Jersey

EPA Region 2
and OERR



TS-PIC-90900
February 1991

Site Analysis
Chemsol Site
Piscataway, New Jersey

by
George Mika, Imagery Analyst
The Bionetics Corporation
Warrenton, Virginia 22186

Contract No. 68-03-3532

Project Officer
Thomas R. Osberg
Environmental Photographic Interpretation Center
Environmental Monitoring Systems Laboratory
Warrenton, Virginia 22186, FTS 557-3110

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89193-3478

NOTICE

This report has undergone a technical and quality control/assurance review and approval by personnel of the EPA/ORD Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), and is for internal Agency use and distribution only.

ABSTRACT

The Chemsol site is an inactive facility located in the municipality of Piscataway, New Jersey, west of South Plainfield. It operated from the 1950's through 1964, during which time solvent recovery operations and plastic resin manufacturing took place.

The Environmental Protection Agency's (EPA) Region 2 requested an analysis of aerial photography to identify locations where wastes may have been buried. Two impoundments, two probable excavations, two possible excavations and two graded fill areas were located as possible burial sites. Ground staining, standing liquids, probable standing liquids, possible drums, refuse piles, and tanks were also identified.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Advanced Monitoring Systems Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 2 in New York, New York, and the Office of Emergency and Remedial Response in Washington, D.C. This analysis covers the period from 1951 to 1991, and this report was completed in February 1991.

CONTENTS

FIGURES

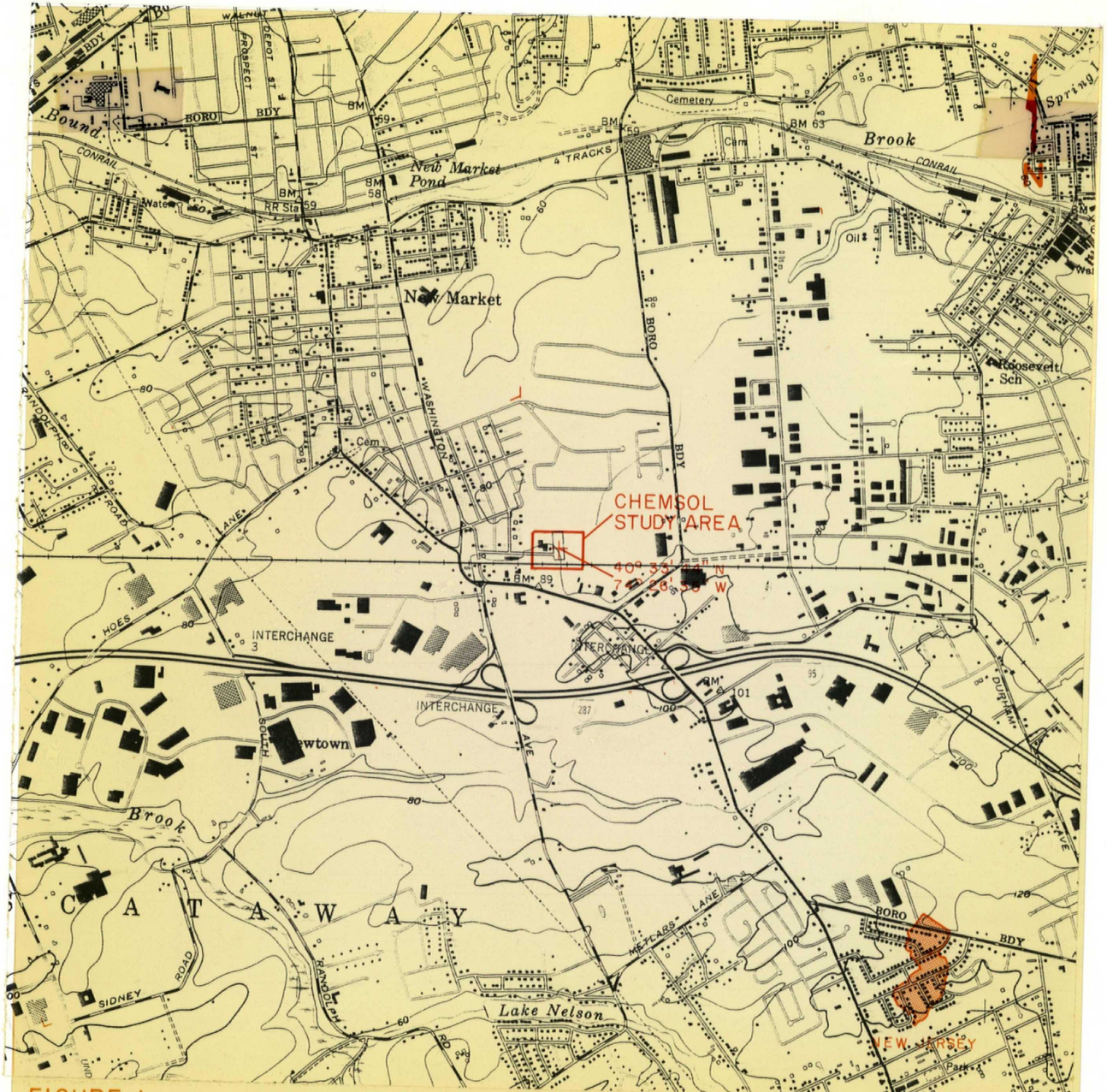


FIGURE 1
CHEMSOL SITE

LOCATION MAP
PLAINFIELD, NJ QUAD

APPROX. SCALE 1:24,000

INTRODUCTION

This report presents an analysis of aerial photography of the Chemsol site in Piscataway, New Jersey. It operated from the 1950's through 1964, during which time its operations included solvent recovery. After numerous industrial accidents, including fires and explosions, the Township of Piscataway ordered Chemsol to cease operations. The analysis was conducted to support the Environmental Protection Agency (EPA) Region 2's remedial investigation of the site.

Figure 1 shows the site location, keyed to a photocopy of a U.S. Geological Survey (USGS) 1:24,000-scale topographic map. Site boundaries used in this analysis were determined from observations made from the aerial photography and information supplied by EPA Region 2 and do not necessarily denote legal property lines or ownership. The area within the site boundary on Figure 1 represents approximately 6 hectares (15 acres).

Black and white aerial photography of the Chemsol site from 1951, 1957, 1958, 1961, 1963, 1967, and 1976; and color photography from 1991 were used for this analysis.[1] The Chemsol site was not yet present on the 1951 photography, on which the area appeared as an open field; therefore, it was not reproduced for this report.

During the removal of PCB-contaminated soils from the site in the summer of 1988, several thousand small capacity (1 gallon or less) containers of unknown materials were exhumed, some of which are still being stored onsite in a trailer within a fenced area. Further excavation in the spring of 1990 uncovered more buried wastes.[2] The analysis of aerial photography entailed a search for areas where wastes may have been buried, as well as for other environmentally significant activities and features. Findings include two impoundments, two probable excavations, two possible excavations and two graded fill areas which may have been burial sites. Ground staining, standing liquids, probable standing liquids, possible drums, refuse piles and tanks were also identified. The scale and resolution of the photography available for analysis was insufficient to identify containers of 1-gallon capacity.

---

[1]A complete listing of maps and photography used in this report is provided in the References section.

[2]Collateral data supplied by EPA Region 2. Hereafter, an asterisk (*) indicates collateral information supplied by EPA.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Advanced Monitoring Systems Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 2 in New York, New York and the Office of Emergency and Remedial Response in Washington, D.C. This analysis covers the period from 1951 to 1991, and the report was completed in February 1991.

METHODOLOGY

A search of government and commercial sources was undertaken to obtain the best available aerial photography of the site spanning the desired time frame. The photography and other sources of information used in this report are listed in the References section.

The analysis was performed by viewing backlit transparencies of aerial photography through stereoscopes. Stereoscopic viewing creates a perceived three-dimensional effect which, when combined with viewing at various magnifications, enables the analyst to identify signatures associated with different features and environmental conditions. The term "signature" refers to a combination of visible characteristics (such as color, tone, shadow, texture, size, shape, pattern, and association) which permit a specific object or condition to be recognized on aerial photography.

Photographic prints were made from those years of aerial photographic coverage that reveal significant information about the site. The analyst's findings are annotated on overlays to prints and/or base maps and described in the accompanying text. Site boundaries or areas used in this analysis were determined from the aerial photography in conjunction with collateral data supplied by EPA Region 2 and do not necessarily denote legal property lines or ownership.

Due to factors inherent in the photographic printing process, prints do not exhibit the level of detail that is visible in the original aerial photography. Therefore, some features identified from the aerial photography may not be clearly discernible, or even visible, on the photographic prints presented in this report.

The terms "possible" and "probable" are used to indicate the degree of certainty of signature identification. "Possible" is used when only a few characteristics are discernible or these characteristics are not unique to a signature. "Probable" is used when incrementally more characteristics are discernible. No qualifying terms are used when the characteristics of a signature allow for a definite feature identification.

AERIAL PHOTO SITE ANALYSIS

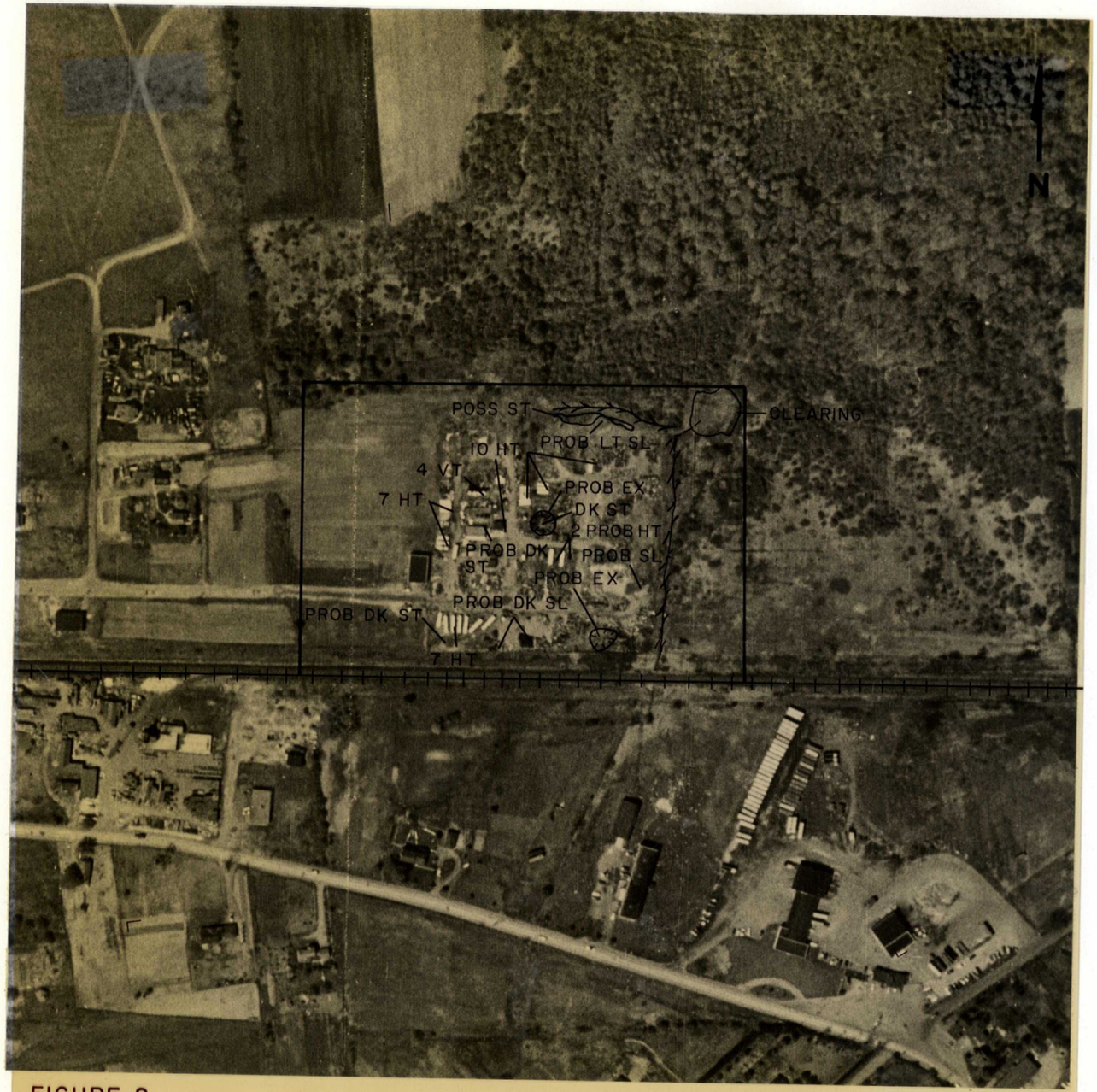
MAY 1, 1957 (FIGURE 2)

The 1951 photography was not reproduced for this report, as the study area was still farmland. In 1957, the first year Chemsol appears on available photography, the site is bounded by railroad tracks to the south, farmland to the west, and wooded areas to the north and east. The site has already been active for a while and is crossed by a network of dirt roads. Numerous mounds of unknown materials and possible refuse can be seen throughout the site and are not annotated. No evidence of waste burial is seen. Two probable shallow excavated (EX) areas were found, one in the center of the site which exhibits dark-toned (DK) staining (ST), and one along the southern boundary of the site in the vicinity of a drum storage area.* In addition to the drum storage area, three additional areas of concern are mentioned in collateral information: a containment area* in the southeast corner of the study area, a trench* in the southeast quadrant and a small dump area* in the northeast corner of the study area. The trench mentioned in collateral information cannot be seen in the vicinity where it is described as being on any of the photography analyzed and will not be referred to again in this report. The containment area has not yet been constructed.

A clearing in the northeast corner of the study area has an access road leading to it from the site. This clearing is in the general vicinity of the small dump area.* The berm in the northeast corner has a break in it, giving access to the clearing as well as allowing runoff from the site to pass through. Possible dark-toned staining is found along the berm. Probable light-toned (LT) standing liquid (SL) in the northeast quadrant suggests areas where runoff temporarily collects.

Areas of probable dark-toned standing liquid are located along the southern edge and in the southeast quadrant.

Horizontal tanks (HT), vertical tanks (VT), and probable horizontal tanks are found at various points on the site. Dark-toned stains can be seen along the southern edge of the seven tanks in the lower southwest quadrant through 1967. The same locations are used for tank storage throughout the study period. They will continue to be annotated but are discussed only when significant changes occur. Numerical annotations on the overlays describe the number of tanks at that location.



LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

--- - Access Road
- Berm
- Channelized Drainage
- Drainage
- Edge of Slope
- Feature Outline
..... - Historical Boundary
- Railroad
- Site Boundary
- Trench

FIGURE 2
CHEMSOL SITE MAY 1, 1957 APPROX. SALE 1:3,150

NOVEMBER 20, 1958 (FIGURE 3)

The probable excavated area along the southern boundary appears essentially unchanged. Just east of this is a smaller possible excavation with dark-toned liquid (LQ). Several small piles of possible refuse (not annotated) are found in this area. Numerous other small mounds of unknown materials are still found throughout the site.

An impoundment (IM) has been constructed at the containment area* in the southeast corner of the study site. It is contained by a low berm and divided in half by a central berm. A dirt access road has been constructed parallel to the railroad tracks along the southern site boundary, leading to the impoundment. The even tone and texture across the surface of the impoundment suggests a possible layer of shallow liquid.

A second similarly shaped, somewhat smaller impoundment has been constructed in the northeast quadrant of the site. Four small unidentifiable objects appear in one section of the impoundment. Standing liquid can be seen near the impoundment's western side. An area of possible disturbed ground (DG) is found in the northeast quadrant, just below the berm.

The clearing in the vicinity of the small dump area* appears more vegetated; no activity can be seen there.

Five horizontal tanks have been added since 1957, and one horizontal tank has been removed. Approximately six more vertical tanks have been added.

LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

--- - Access Road
- Berm
- Channelized Drainage
- Drainage
- Edge of Slope
- Feature Outline
- Historical Boundary
- Railroad
- Site Boundary
- Trench

FIGURE 3
CHEMSOL SITE NOVEMBER 20, 1958 APPROX. SCALE 1:2,810

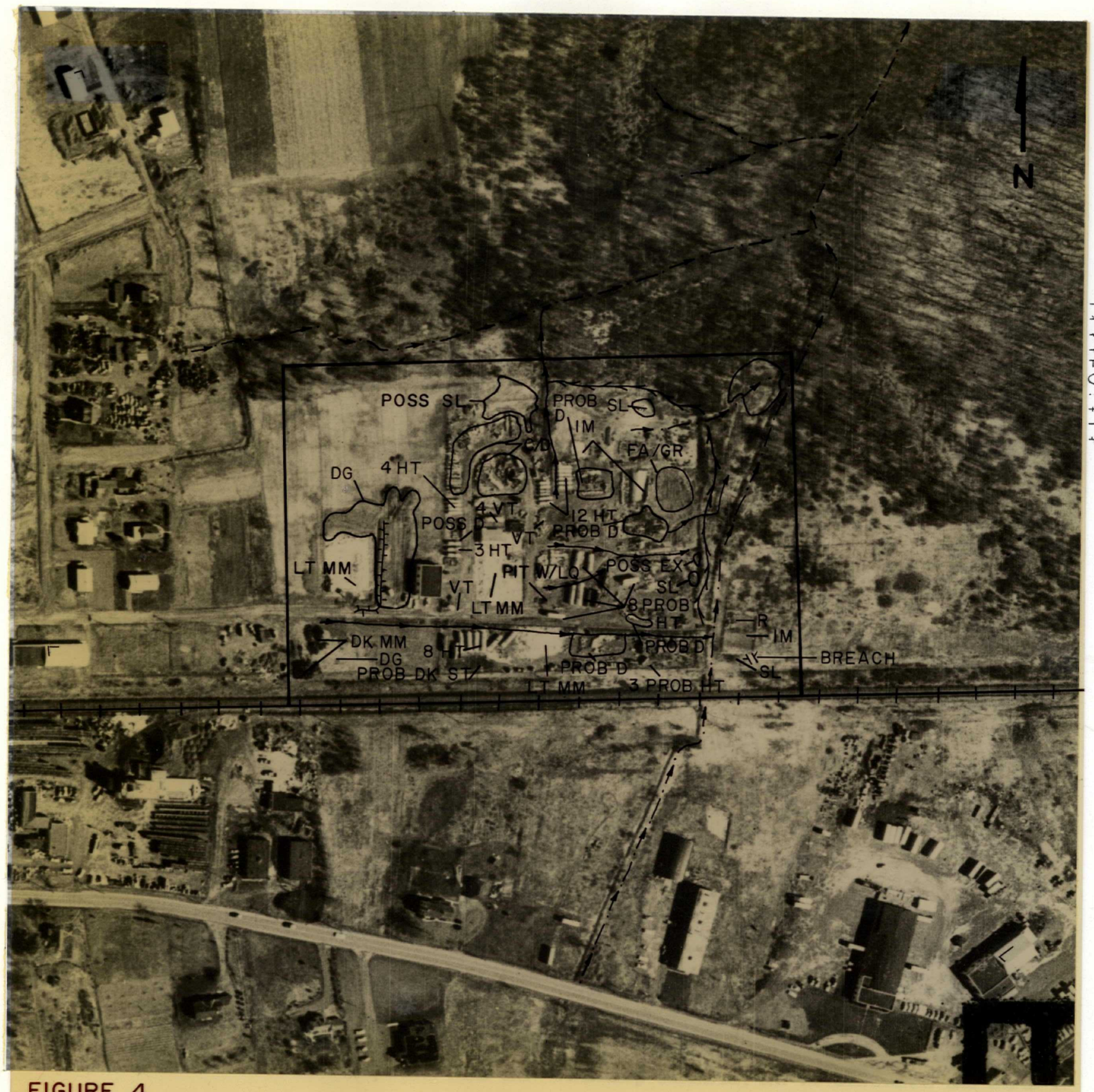
APRIL 20, 1961 (FIGURE 4)

Probable drums (D) can be seen in the vicinity of the drum storage area.* Dark objects (not annotated), possibly containers smaller than a drum, are scattered haphazardly in the southeast corner of this area. Three probable horizontal tanks have also been placed in this area. The probable excavated area has been filled, as has the one in the center of the site. A drainage channel has been dug along the north side of the drum storage area,* parallel to the southern site boundary and running the entire width of the site. It empties into the stream on the east side of the study area through a gap in the berm. Slightly north of this gap, also along the berm, a possible shallow excavation can be seen. At this location another drainage channel ends and standing liquid is seen. At the other end of this channel, still in the southeast quadrant, is a pit with liquid.

A mound of light-toned, medium-textured material (MM) has been deposited to the west of this area. Two other mounds of what appears to be the same material have also been deposited within the site. One, measuring 130 feet long by 100 feet wide, is located in the south central section of the site, and the other, measuring 100 feet by 90 feet, is located on the west side of the site. Two mounds of an unidentifiable dark-toned material are seen in the southwest corner of the site, partially covering an area of disturbed ground.

The impoundment at the containment area* has developed a breach in one berm. The only apparent contents are mounded refuse (R). Standing liquid is seen just outside its southwest side. The impoundment in the northeast quadrant has been restructured from two square sections into two rectangular compartments. The eastern one holds a light-toned liquid and the western one holds a dark-toned liquid. Probable drums, some arranged in rows and some apparently discarded, can be seen west and south of this impoundment. Dark objects (not annotated), possibly containers smaller than a drum, are mixed with the drums south of the impoundment as well as in the northeast corner. Another small square impoundment has been constructed to the northwest of this, and holds a light-toned liquid. In the same quadrant, near the eastern berm, a graded (GR) fill area (FA) can be seen. There is no indication of what might have been buried in this area.

The former clearing, referred to as a small dump area,* shows no sign of activity and is continuing to revegetate.



LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

--- - Access Road
- Berm
- Channelized Drainage
- Drainage
- Edge of Slope
- Feature Outline
- Historical Boundary
- Railroad
- Site Boundary
- Trench

FIGURE 4
CHEMSOL SITE APRIL 20, 1961 APPROX. SCALE 1:2,560

In addition to the probable drums seen in the eastern half of the site, a mixture of neatly arranged drums and containers (C) are located along both sides of the access road in the northwest quadrant. Just north of these is an area of possible dark-toned standing liquid contained by a berm.

Disturbed ground and a trench can be seen just west of the building in the southwest quadrant. Vertical tanks appear in the same areas as in 1958.

Possible refuse (not annotated) continues to be seen at numerous points around the site.

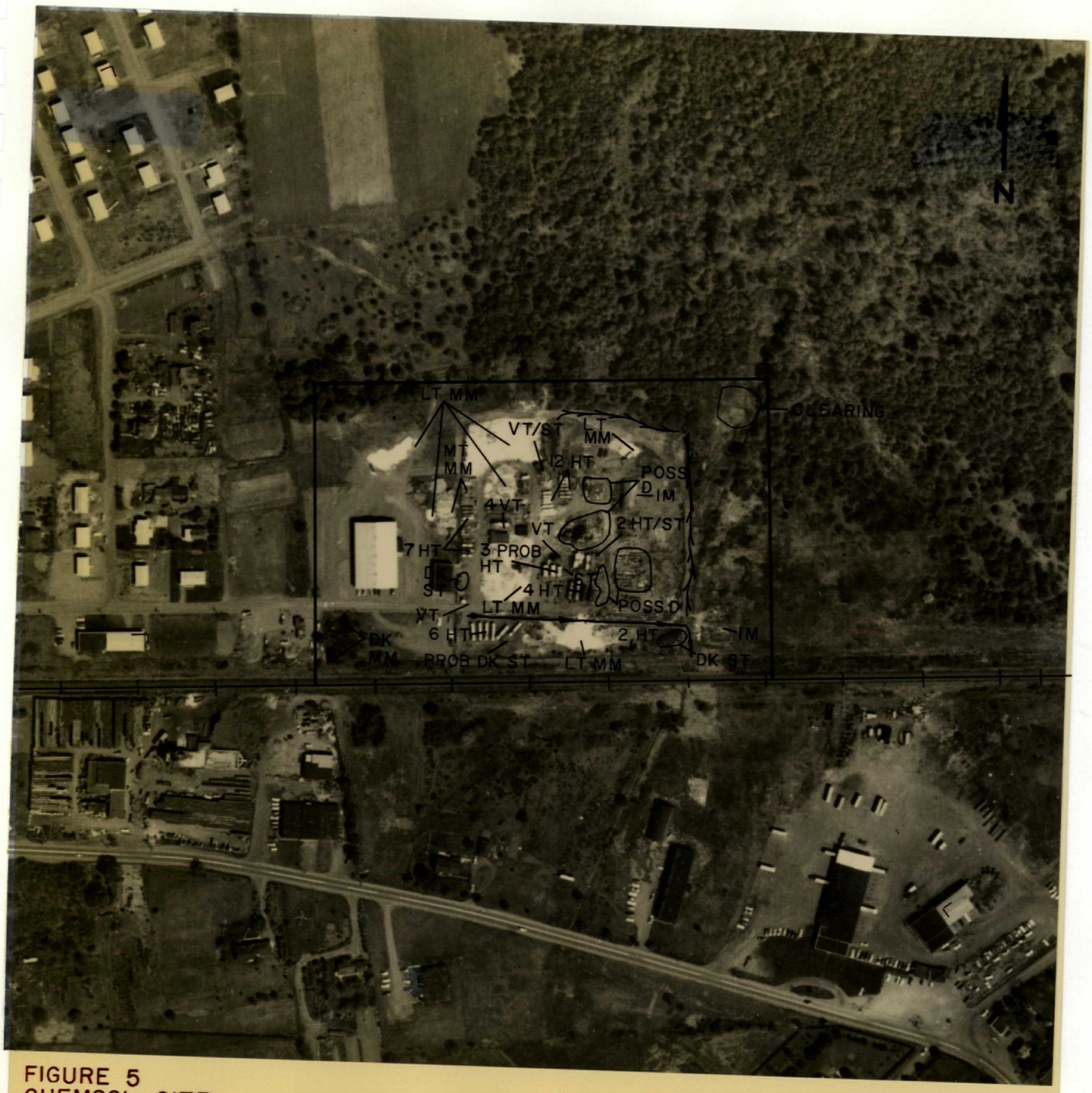
MAY 7, 1963 (FIGURE 5)

The drum storage area* now contains two horizontal tanks. The possible drums have been removed. The mound of light-toned material has spread out somewhat over a section of the drum storage area.* The original section of the mound has become multi-toned, possibly due to revegetation, and reduced in height. Part of the mound extends into the drainage channel. Staining is noted around a vertical tank to the west, as well as around the horizontal tanks in the southeast quadrant, near the center of the site, and also associated with a vertical tank outside a building in the southwest quadrant. Dark staining also appears in the southeast corner of the site. A building has been constructed on the site of the westernmost mound seen on 1961 coverage. The disturbed ground between the building and the former mound has been filled and leveled. The dark mounded material just south of this building is still present. Five other light-toned mounds of varying size are found in the study area.

The berm surrounding the impoundment at the containment area* has undergone further decay. A few small unidentifiable objects can be seen in it. The impoundment with the parallel trench in the northeast quadrant is still present and is filled with light-toned liquid. The smaller impoundment to the northwest has been filled; however, the area still appears wet or stained (not annotated).

The clearing in what is referred to as the small dump area* shows no sign of activity.

Possible drums are concentrated in the northeast and southeast quadrants, towards the center of the site. A mound of light-toned material and a mound of medium-toned (MT) material now cover much of the previous area of drums and containers in the northwest quadrant. The dark-toned possible



LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

--- - Access Road
- Berm
- Channelized Drainage
- Drainage
- Edge of Slope
- Feature Outline
- Historical Boundary
- Railroad
- Site Boundary
- Trench

FIGURE 5
CHEMSOL SITE

MAY 7, 1963

APPROX. SCALE 1:2,930

containers in the northeast and southeast corners of the site are no longer present, and far fewer haphazardly scattered possible drums are seen. The berm running along the east side of the site has been renovated. Two gaps remain in it, one across from the southeastern impoundment and one allowing access to the clearing.

Possible refuse (not annotated) continues to be seen at various points around the site.

APRIL 11, 1967 (FIGURE 6)

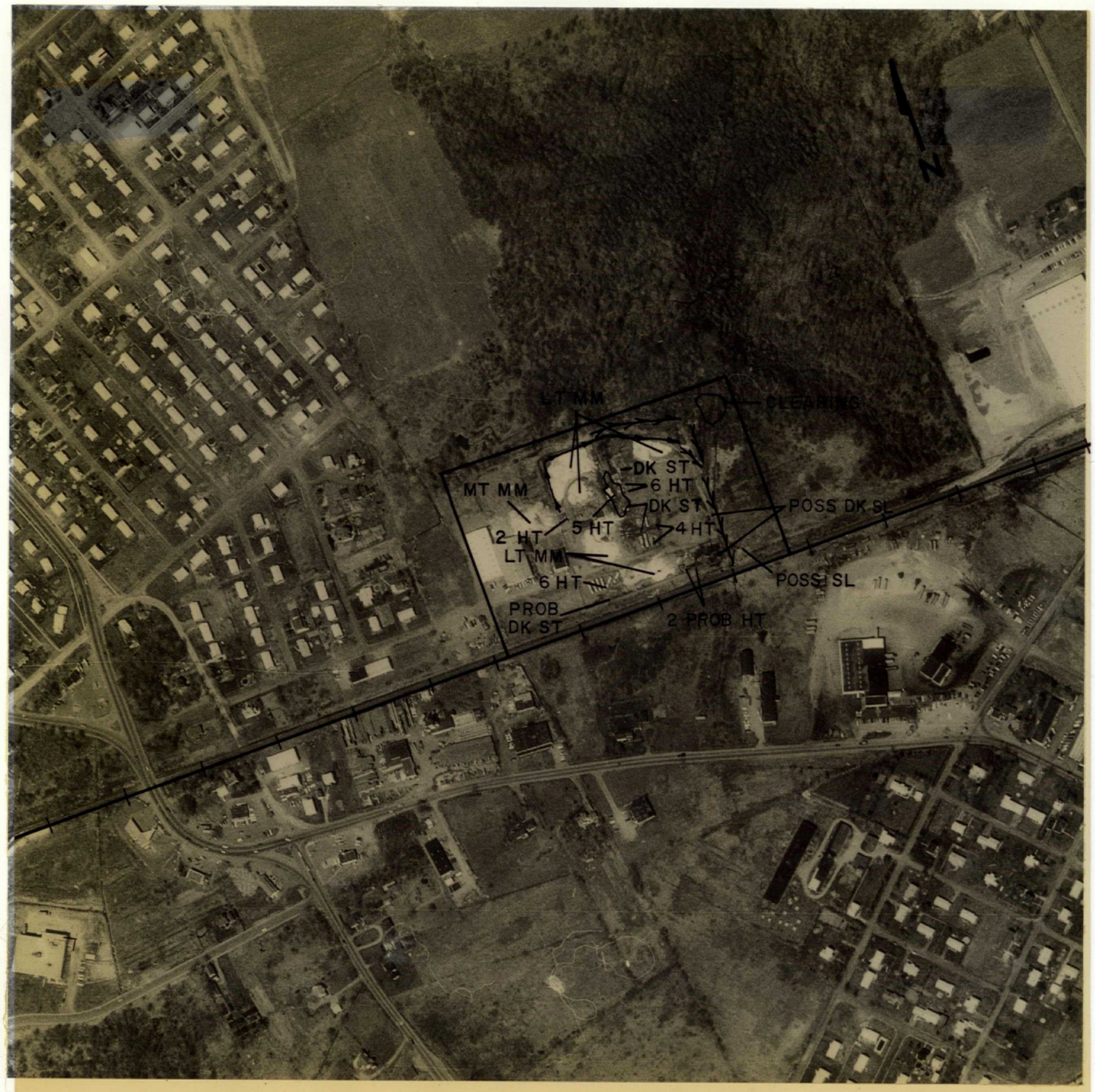
According to collateral data, Chemsol ceased operations in 1964.

The area referred to as a drum storage area* has been cleared of all identifiable objects except for the two probable horizontal tanks. Possible dark-toned standing liquid can be seen near the berm in this area.

The berms around the impoundment at the containment area* have been leveled, with only a shallow depression and possible standing liquid remaining. The northwesternmost mound of light-toned material has been removed. The other five remain, as does the medium-toned material. Material from the westernmost mound has shifted to the west. The dark-toned mounds in the southwest corner are no longer present. Approximately 17 horizontal tanks remain in the center of the site, as do the 6 probable tanker trailers in the southwest corner. No vertical tanks can be seen. Staining is noted near all the horizontal tanks. A new drainage channel has been dug just inside the berm along the north side of the study area.

The clearing continues to revegetate and no sign of dumping activity is present. A small pool of possible dark-toned liquid can be seen along the berm in the southeast quadrant.

Very little refuse (not annotated) can be seen.



LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

- - - Access Road
Berm
Channelized Drainage
Drainage
Edge of Slope
Feature Outline
Historical Boundary
Railroad
Site Boundary
Trench

FIGURE 6
CHEMSOL SITE APRIL 11, 1967 APPROX. SALE 1:4,800

MARCH 26, 1976 (FIGURE 7)

Shallow excavations are visible in the drum storage area,* bordering the south side of the drainage channel. The drainage channel in this area has been partially filled. To the west the channel is mostly open with occasional small, unidentifiable light- and dark-toned objects (not annotated) along its bottom.

A shallow depression remains at the former impoundment* (not annotated). Dark-toned standing liquid can be seen in the northeast corner of the site along the berm, and on the southeast side of the site, also along the berm. Overflow from both areas of standing liquid runs through breaks in the berm and flows by the east side of the clearing in the northeast corner, just beyond which it runs into a stream. No dumping is visible in the clearing. Dark-toned standing liquid can also be seen in the vicinity of where six horizontal tanks had been in 1967. In the northwest quadrant dark-toned standing liquid is seen between the two northernmost mounds of light-toned material.

Dark staining can be seen between the eastern building and the medium-toned mound in the southwest quadrant. The only remaining horizontal tank visible on the site is just north of this stain.

Light-toned and medium-toned mounded material is found in the same locations as in 1967.

Disturbed ground can be seen over much of the southeast quadrant, particularly towards the center of the site. A possible graded fill area can be seen just west of the dark-toned standing liquid.

The two western buildings have been razed, with only the concrete foundations remaining. Refuse is piled against one foundation wall. Further refuse is seen northwest of the foundation and in the southeast quadrant near the center of the site.

LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

--- - Access Road
- Berm
- Channelized Drainage
- Drainage
- Edge of Slope
- Feature Outline
- Historical Boundary
- Railroad
- Site Boundary
- Trench

FIGURE 7
CHEMSOL SITE

MARCH 26, 1976

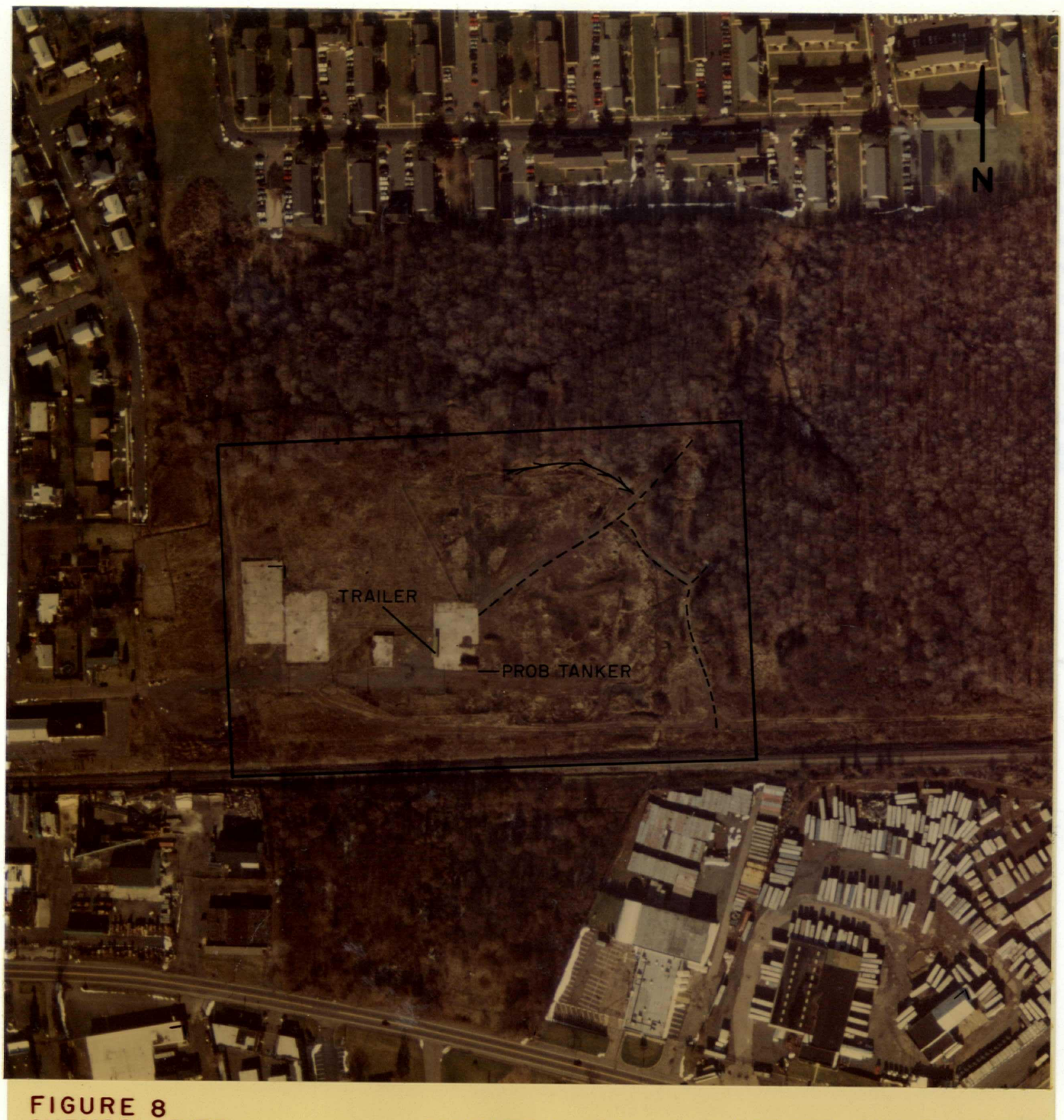
APPROX. SCALE 1:1,900

JANUARY 1, 1991 (FIGURE 8)

The drum storage area* appears to be revegetating. The drainage channel running parallel to the southern boundary of the site has been filled.

A possible shallow depression remains at the former impoundment* (not annotated). A road has been constructed that runs from the center of the site towards the northeastern boundary of the site. One branch of this road runs south past the former impoundment.*

All mounds of light- and medium-toned material have been removed, and the one remaining building has been razed. A trailer and probable tanker are parked on the foundation of one of the razed buildings.



LEGEND

C - Containers
D - Drums
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
FA - Fill Area
GR - Graded Area
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
MM - Mounded Material
MT - Medium-Toned
R - Refuse
SL - Standing Liquid
ST - Stain
VT - Vertical Tank

- - - Access Road
Berm
Channelized Drainage
Drainage
Edge of Slope
Feature Outline
Historical Boundary
Railroad
Site Boundary
Trench

FIGURE 8
CHEMSOL SITE JANUARY 1, 1991 APPROX. SCALE 1:2,700

REFERENCES

AERIAL PHOTOGRAPHY

Date	Agency	Mission Code	Agency Frame #	Orig. Scale	EPIC Frame #
April 20, 1951	TXAERO[1]		3429,3430	1:20,000	31376,31377
May 1, 1957	ASCS[2]	CNA	158,159	1:20,000	31388,31097
November 20, 1958	TXAERO	926	172,173	1:24,000	31197,31198
April 20, 1961	TXAERO	1116	738,739	1:18,000	31195,31196
May 7, 1963	ASCS	CNA	64,65	1:20,000	31036:10,11
April 11, 1967	TXAERO	1630	90,91	1:30,000	8418,8419
March 26, 1976	ROBASI[3]	MDL	74,75	1:9,600	32566,32567
January 1, 1991	EPA[4]	91/001	9,10	1:16,000	91/001:9,10

MAP

Source	Name	Scale	Date
USGS[5]	Plainfield, N.J.	1:24,000	1981

---

[1]Aero Service Division, Houston, Texas

[2]Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

[3]Robinson Aerial Surveys, Inc., Newton, New Jersey

[4]U.S. Environmental Protection Agency

[5]U.S. Geological Survey, U.S. Department of the Interior

CHEMSOL